

WHAT IS CLAIMED IS:

1. A vehicle range shift mechanism comprising:

a range selecting mechanism for selecting a shift range;

a drive mechanism that is interlocked with and drives the range selecting mechanism;

a range operating mechanism for operating a changeover valve with the driving force of the drive mechanism to change the shift range of an automatic transmission;

a transmitting mechanism for transmitting the driving force of the drive mechanism to the range operating mechanism;

a first range detection section that detects a shift range corresponding to an operating position of the transmitting mechanism;

a second range detection section that detects the actual shift range as changed by the range operating mechanism;

a judging section that judges whether or not the shift ranges detected by the first and second range detection sections are in mutual agreement; and

a failure judging section that judges a failure of the first range detection section when the detected ranges are judged by the judging section as not in mutual agreement.

2. The vehicle range shift mechanism according to claim 1,

wherein the automatic transmission is provided with first and second friction engaging elements that respectively correspond to a forward range and a reverse range, and first and second hydraulic servos that respectively operate the first and second friction engaging elements;

wherein the second range detection section is provided with first and second hydraulic pressure detecting sensors that respectively detect the presence of hydraulic pressure supplied to the first and second hydraulic servos, and a range judging section that judges the shift range of the automatic transmission based upon input from both hydraulic pressure detecting sensors, and

wherein the range judging section judges the shift range as a forward range when the first hydraulic pressure detecting sensor detects hydraulic pressure supplied to the first hydraulic servo and the second hydraulic pressure detecting sensor detects hydraulic pressure supplied to the second hydraulic servo, judges the shift range as a reverse range when the first hydraulic pressure detecting sensor does not detect the supply of hydraulic pressure to the first hydraulic servo and the second hydraulic pressure detecting sensor detects the supply of hydraulic pressure to the second hydraulic servo, and judges the shift range as a non-traveling range when neither of the hydraulic pressure detecting sensors detects a supply of hydraulic pressure.

3. The vehicle range shift mechanism according to claim 1,

wherein the second range detection section is provided with first and second rotation detecting sensors that respectively detect the number of rotations of a rotating element on an input side and a rotating element on an output side of the automatic transmission, and a range judging section that judges shift range of the automatic transmission based upon inputs from both the rotation detecting sensors, and

wherein the range judging section compares the number of rotations detected by the second rotation detecting sensor and the number of rotations detected by the first

rotation detecting sensor and calculates a ratio thereof, judges the shift range to be a forward range when the ratio is greater than 0, judges the shift range to be a reverse range when the ratio is less than 0, and judges the shift range to be a non-traveling range when the ratio is 0.

4. The vehicle range shift mechanism according to claim 1 further comprising a controller that executes a preset fail-safe procedure when the failure judging section judges a failure.

5. The vehicle range shift mechanism according to claim 2 further comprising a controller that executes a preset fail-safe procedure when the failure judging section judges a failure.

6. The vehicle range shift mechanism according to claim 3 further comprising a controller that executes a preset fail-safe procedure when the failure judging section judges a failure.

7. The vehicle range shift mechanism according to claim 4, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller generates an alarm and stops the drive mechanism as a fail-safe procedure, responsive to judgement of failure by the failure judging section, detection of a traveling range by the second range detection section, and detection of a traveling speed equal to or greater than a predetermined value by the speed detection section

8. The vehicle range shift mechanism according to claim 5, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller generates an alarm and stops the drive mechanism as a fail-safe procedure, responsive to judgement of failure by the failure judging section, detection of a traveling range by the second range detection section, and detection of a traveling speed equal to or greater than a predetermined value by the speed detection section.

9. The vehicle range shift mechanism according to claim 6, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller generates an alarm and stops the drive mechanism as a fail-safe procedure, responsive to judgement of failure by the failure judging section, detection of a traveling range by the second range detection section, and detection of a traveling speed equal to or greater than a predetermined value by the speed detection section.

10. The vehicle range shift mechanism according to claim 4, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller changes the traveling range to a parking range with the range operating mechanism by driving the drive mechanism in one direction for a predetermined amount of time or longer as a fail-safe procedure in a case where the failure judging section judges a failure when the second range detection section detects a traveling range and the speed detection section detects a traveling speed that is less than a predetermined value.

11. The vehicle range shift mechanism according to claim 5, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller changes the traveling range to a parking range with the range operating mechanism by driving the drive mechanism in one direction for a predetermined amount of time or longer as a fail-safe procedure in a case where the failure judging section judges a failure when the second range detection section detects a traveling range and the speed detection section detects a traveling speed that is less than a predetermined value.

12. The vehicle range shift mechanism according to claim 6, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller changes the traveling range to a parking range with the range operating mechanism by driving the drive mechanism in one direction for a predetermined amount of time or longer as a fail-safe procedure in a case where the failure judging section judges a failure when the second range detection section detects a traveling range and the speed detection section detects a traveling speed that is less than a predetermined value.

13. The vehicle range shift mechanism according to claim 4, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller generates an alarm while stopping the drive mechanism as a fail-safe procedure responsive to judgement of a failure by the failure judging section when the second range detection section detects a traveling range and the speed detection section detects a traveling speed that is less than a predetermined value.

14. The vehicle range shift mechanism according to claim 5, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller generates an alarm while stopping the drive mechanism as a fail-safe procedure responsive to judgement of a failure by the failure judging section when the second range detection section detects a traveling range and the speed detection section detects a traveling speed that is less than a predetermined value.

15. The vehicle range shift mechanism according to claim 6, further comprising a speed detecting sensor that detects a vehicle traveling speed, and wherein the controller generates an alarm while stopping the drive mechanism as a fail-safe procedure responsive to judgement of a failure by the failure judging section when the second range detection section detects a traveling range and the speed detection section detects a traveling speed that is less than a predetermined value.